

Claims

[c1] What is claimed is:

1.A converting module for converting a first analog voltage into a digital output value, comprising:

a comparator for comparing the first analog voltage with a threshold voltage and generating a comparison result, the threshold voltage corresponding to a first group of digits containing at least one digit;

a subtracting circuit generating a second analog voltage by subtracting the threshold voltage from the first analog voltage if the comparison result indicates that the first analog voltage is greater than or equal to the threshold voltage; and

an analog-to-digital converter for converting the second analog voltage into a second group of digits, and concatenating the first group of digits and the second group of digits to form the digital output value.

[c2] 2.The converting module of claim 1 further comprising a controller for controlling the subtracting circuit according to the comparison result generated by the comparator and for controlling operation of the analog-to-digital converter.

- [c3] 3.The converting module of claim 1 wherein the threshold voltage is equal to a saturation voltage of the comparator.
- [c4] 4.A method of operating a converting module, the method comprising:
receiving an analog voltage;
comparing the analog voltage to a threshold voltage and generating a comparison result;
subtracting the threshold voltage from the analog voltage if the comparison result indicates that the analog voltage is greater than or equal to the threshold voltage;
and
converting the analog voltage into a digital output voltage.
- [c5] 5.The method of claim 4 wherein the threshold voltage is equal to a saturation voltage of the comparator.
- [c6] 6.A touchpad for detecting location of a point in contact with a surface of the touchpad, comprising:
a touch input transducer for converting the location of the point into analog transduced voltages proportional to a distance of the point from peripheral sides of the surface of the touchpad; and
a converting module for converting the analog trans-

duced voltages into a set of digital codes representing the location of the point upon the surface of the touchpad, the converting module comprising:

a comparator for comparing each analog transduced voltage with a threshold voltage and generating a comparison result;

a subtracting circuit for subtracting the threshold voltage from each analog transduced voltage if the comparison result indicates that the analog transduced voltage is greater than or equal to the threshold voltage; and

an analog-to-digital converter for converting the analog transduced voltage into a digital output voltage.

[c7] 7.The touchpad of claim 6 wherein the converting module further comprises a controller for controlling the subtracting circuit according to the comparison result generated by the comparator and for controlling operation of the analog-to-digital converter.

[c8] 8.The touchpad of claim 6 wherein the surface of the touchpad is divided into at least four regions, and each region is associated with a unique range of analog transduced voltages produced by the touch input transducer.

[c9] 9.The touchpad of claim 6 wherein the touch input transducer comprises:
a first resistor disposed along a first direction of the

touchpad, the first resistor being divided into at least first and second sections; and
a second resistor disposed along a second direction of the touchpad, the second resistor being divided into at least third and fourth sections, wherein the first direction is perpendicular to the second direction.

[c10] 10. The touchpad of claim 9 wherein when the point is located in a region corresponding to the first section of the first resistor, the analog transduced voltage is less than the threshold voltage, and when the point is located in a region corresponding to the second section of the first resistor, the analog transduced voltage is greater than or equal to the threshold voltage.

[c11] 11. The touchpad of claim 9 wherein when the point is located in a region corresponding to the third section of the second resistor, the analog transduced voltage is less than the threshold voltage, and when the point is located in a region corresponding to the fourth section of the second resistor, the analog transduced voltage is greater than or equal to the threshold voltage.

[c12] 12. The touchpad of claim 9 wherein a linear resolution of the touchpad corresponding to each of the first and second sections of the first resistor and the third and fourth sections of the second resistor is equal to a reso-

lution of the analog-to-digital converter.